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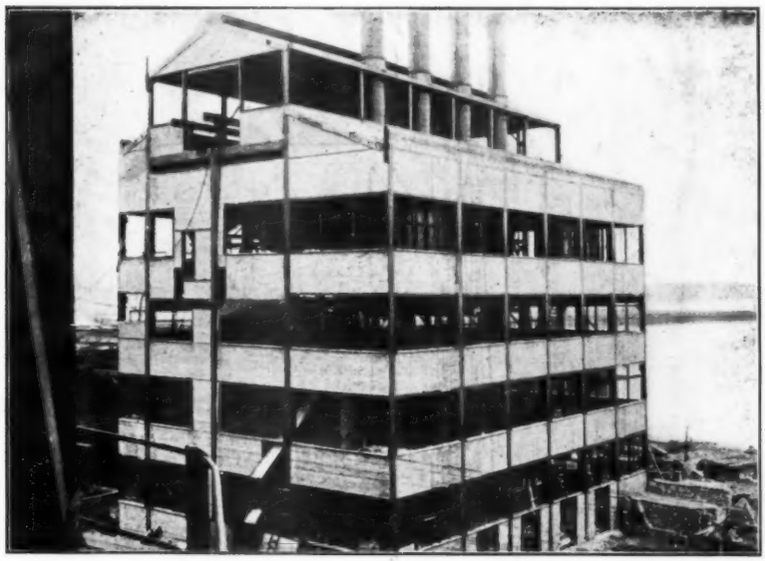

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NEW YORK

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Revolutionizing An Industry

¶ Every once in a while, in every industry, some outstanding improvement comes forward and completely overturns old principles.

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Inside Story of 60-Cent Gas in Indianapolis

Brief Submitted Gives Illuminating Facts

For the first time the inside story of 60-cent gas in Indianapolis has been given to the general public through a brief just filed with the Public Service Commission of Indiana by Henry H. Hornbrook, attorney for the Citizens Gas Company, which is petitioning the Indiana commission for authority to leave the 60-cent basis and go to a 90-cent basis, without which it cannot serve its patrons, it contends.

For many years the 60-cent gas company in Indianapolis has been the talk of American gas companies. Everybody in the gas field knew that it was a by-product plant and that its earnings from sales of other materials than gas made it possible for it to continue selling gas to its patrons at the abnormally low price of 60 cents a thousand cubic feet.

But through long years of political subterfuge and manipulations of various kinds, the company has been forced to keep itself on a 60-cent gas basis, until the climax of the war emergency's operating costs made it seek the Indiana regulatory body with a petition for immediate relief. The company first undertook to educate its customers to the dire necessity it was facing. Then the hearing was held before the commission, discussion of which has appeared in the JOURNAL. The next step was the filing of the company's brief, wherein, for perhaps the first time, the general public throughout the country can be acquainted with the real reasons for the maintenance of 60-cent gas in Indianapolis.

The brief goes directly to the heart of the situation when it says that "gas, in and of itself, cannot be produced any more cheaply in Indianapolis than elsewhere."

"There still remains in the minds of many people," says the brief, "although probably not of those who have given serious thought to the situation with an understanding of the facts, that although gas was produced cheaper in Indianapolis than in other cities, yet in the other cities too much was charged for gas and the price there was exorbitant while here it was kept down to cost. Nothing could be further from the truth. Gas in and of itself cannot be produced any more cheaply in Indianapolis than elsewhere. If the Citizens Gas Company did not have something to sell, and did not succeed in selling these other things at a profit and devoting those profits to the benefit of consumers of gas by applying the same against the cost of manufacturing gas, there would be no such thing as 60-cent gas and there never could be."

The intensely interesting story that is revealed in this article will, we believe, appeal strongly to every man in the gas industry and will furnish much food for thought. It is a concise statement of the efforts of a company to valiantly meet adverse conditions.—Editor

Statement Long Awaited

This statement has been long awaited by students of the gas industry everywhere. The brief just filed tells the long story of the Indianapolis gas company's fight for existence very graphically. It also includes, for the perusal of the Indiana commission, numerous exhibits of various sorts, touching the gas industry. Many of these exhibits have to do with the cost of gas in other cities. The brief is an unusual epitome of the "case for the public" from a big gas company that must seek relief from the constituted agents of its own patrons. Whether it will be granted the relief asked is, of course, not known, but the Indianapolis company's fight for relief already has attracted wide attention through America.

The brief in part follows:

"The Citizens Gas Company of Indianapolis filed its petition asking for an increase in the rates charged to consumers for gas from 60 cents per thousand cubic feet, as now charged, to 90 cents per thousand cubic feet. This relief was sought under the emergency section of the public utility law and was based primarily upon the urgent necessity of the company to provide additional extensions and betterments to its plant, which were necessary for good service.

which were being urgently requested by the city of Indianapolis but which could not be financed on a basis of the low gas rate then prevailing.

Before the opening of the hearing, a supplemental petition was filed asking for the same relief but basing the request for relief on the further fact that the business conditions which had prevailed for the last three or four months, which promised to continue for an indefinite future, result in leaving the company without sufficient operating income to meet its operating expenses and pay its fixed charges. This supplemental petition was also addressed to the emergency section of the statute, seeking relief temporarily and until the emergency ceases.

Preliminary to any discussion a resume of the evidence showing the company's origin, purpose and history may be helpful.

The Citizens Gas Company was organized as a community effort to supply citizens of Indianapolis with cheap gas. Its stock was sold by popular solicitation on the part of citizens and was widely distributed, there being now more than 2,800 stockholders, mostly residents of the city of Indianapolis and consumers of gas. The company is uniquely organized under a statute which removes all possibility of stock jobbing, watering of stock, "melon cutting" or any other of the old-time popular devices used in the promotion of corporations. The dividends to be paid are absolutely limited, the sole voting rights are divested from the holders of the stock and placed in five trustees who elect the directors. Thus there is no possibility of individuals, through the purchase of stock, acquiring control of the company. Through no amount of ownership can a stockholder by any possibility secure election upon the board of directors or displace in any way the sole power of the trustees to control the organization of the company. The city is given absolute right to purchase the property at the end of the franchise period by repaying the amount of face of the stock invested therein by the stockholders, in so far as the same may not have been repaid; indeed, where stock has been sold at a premium, there is no obligation to return this premium, and the city has the right to take over the property at the par value of the stock, plus unpaid dividends, less any amount which may have been repaid on the stock.

The company thus far has abundantly fulfilled its purposes. It has for twelve years maintained a gas rate of 60 cents or lower, the cheapest in the United States where manufactured gas was supplied, and has thus been one of the chief factors in the development of the city.

Secured Control of Competition

At the time it was organized, the Indianapolis Gas Company had control of the gas situation in Indianapolis, and was furnishing gas at 90 cents per thousand cubic feet and insisting that it was impossible for the Citizens Gas Company to succeed. Within four years after the Citizens Gas Company began business, it secured control of its competitor, which was then furnishing gas to more than three times the number of consumers who were being furnished by the Citizens Gas Company, and since that time it has furnished gas to those who had been consumers of the Indianapolis Gas Company at the same low rate which was enjoyed by the consumers of the Citizens Gas Company. Indeed, for a period of four and one-half years, the rate was reduced to 55 cents, being restored to 60 cents July 1, 1918.

At this point, it is very important that it be clearly borne in mind how this result has been made possible. There still remains in the minds of many people, although probably not of those who have given serious thought to the situation with an understanding of the facts, that although gas was produced cheaper in Indianapolis than in other cities, yet in the other cities too much was charged for gas and the price there was exorbitant while here it was kept down to cost. Nothing could be further from the truth. Gas in and of itself cannot be produced any more cheaply in Indianapolis than elsewhere. If the Citizens Gas Company did not have something else to sell, and did not succeed in selling these other things at a profit and devoting those profits to the benefit of consumers of gas by applying the same against the cost of manufacturing gas, there would be no such thing as 60-cent gas and there never could be. This is perfectly illustrated by the history of the cost of water gas which the company has furnished in greater or less degree each year. In the year 1920 the water gas made by the company cost about 67 cents per thousand cubic feet in the holder, and this with less than the normal use of oil and without including any items of overhead, taxes, fixed charges, cost of distribution, collection, depreciation, etc., which items undoubtedly brought the cost of water gas in the year 1920 to somewhere between $1 and $1.25 per thousand cubic feet. The reason that many other cities have gas rates, fixed by this commission, of $1 per thousand cubic feet, or more, lies in the very fact that the consumers are required to absorb the entire cost of producing the gas without having any profits of allied industry contributed for their benefit; and so it has come about that all the profits from the sale of coke, ammonia, tar, benzol and other by-products, have been an indispensable prerequisite to the cheap gas which the citizens of Indianapolis have enjoyed.

Something has been said about the consumers of gas being asked to pay more for their gas in order to make up for the losses in the sale of coke and other by-products. This statement proceeds from the same misconception of facts, the truth being that the situation has always been the other way, and the profits from coke and by-products have kept down the price of gas, and not that the price paid for gas has absorbed losses in the sale of by-products. Whenever it shall come to pass that the price paid for gas or asked for gas is in excess of that which is paid by consumers in communities where gas alone is manufactured, and where, therefore, the consumers, of necessity, must pay the full cost of manufacture, we will then have reached the point where it can fairly be said that the consumers are asked to pay more for gas in order that the allied industries may be supported therefrom. It cannot be too plainly stated and must be clearly understood that an increase in the price of gas only means that for the time being the profits from the allied industries going to reduce the price of gas are less than they have been in the past, and therefore to that extent gas is being asked more nearly to pay its own way. Instead of being carried on a half-fare ticket, the gas consumer may for the time being have to pay three-fourths of a full fare.

Effect of Changing Business Conditions

No better illustration of the effect of changing bus-

iness conditions in the cost of by-product coke oven gas could be cited than the recent order of this commission in fixing the price of 95 cents for gas at Terre Haute, approving a contract between the gas company and the Indiana Coke & Gas Company fixing the price to be paid by the gas company to the coke company for by-product gas as follows:

For first 300,000,000 cu. ft. annually...	$0.31¾ per M
For second 300,000,000 cu. ft. annually	0.26¾ per M
For all over 600,000,000 cu. ft. annually	0.24¼ per M

The above schedule is for unpurified gas metered at the coke ovens. The gas company must absorb purification and storage expenses and transmission losses, as well as its own costs of distribution and of conducting business.

At this point we desire to call attention to the growth in the company's plant account representing new investment which has been required to be made from year to year in order to meet the growing needs of service to the community.

A vital element in the company's history and one which cannot be too strongly emphasized, is the growing need of the company for working capital. Organized under very great difficulties with wholly inadequate means to put the company in a strong position, it has always been hard up for cash, except during brief periods following the sale of its securities. One of its chief difficulties has arisen from the growing demands for working capital, and this was never more embarrassing than at the present time when because of the slackness in industrial demands, the company is not able to convert its coal supply into money, but only into other products which it is unable to move.

A word should be said as to the peculiar obligations under which the company rested to lay in large stocks of coal in the fall of 1920 even at excessive prices in order to be prepared to render service to its gas consumers. It could not take the chance of being able to buy spot coal as needed and so out of sheer public duty laid in a stock of approximately 100,000 tons of coal at enormous cost. Moreover in these present days of depression, when its coke competitors are able to shut down on production and stop losses, petitioner in order to furnish gas is compelled to go on stocking up coke which it cannot sell, and each added ton representing an additional loss to petitioner.

One of the ever-present problems of the company, and one from which it cannot escape, is the payment of taxes on its property. The constant need of additions to its plant carries with it not only the capital requirements to make these additions and the consequent fixed charge upon the new capital, but also the necessary increase in tax burdens.

It is, of course, the duty of the company to set aside from its receipts a reasonable sum to provide for obsolescence and the year to year depreciation upon its property that is subject to depreciation. The property of the company subject to depreciation consists of two major classes of items: First, that which is under ground and subject to very modest requirements in the way of depreciation and reserve, this representing primarily the distribution system of the company; and second, the manufacturing plants of the company above ground which are subject to

(*Continued on page* 343.)

Thirty-Seven Towns Affected by Natural Gas Rate Case

The Oklahoma Corporation Commission has served notice on the mayors, city attorneys and officials of the chambers of commerce of thirty-seven Oklahoma cities and towns furnished directly or indirectly with natural gas by the Oklahoma Natural Gas Company, that the case in which the Oklahoma Natural Gas Company in Aug., 1920, asked the Corporation Commission to make a valuation of its property and fix a flat rate for gas at the city gate or border of each city or town, will be reopened and additional evidence will be taken.

It was in connection with this case that the Corporation Commission, on Dec. 20, 1920, issued an order granting the Oklahoma Natural and the distributing companies handling its gas, authority to put into effect an increase of 10 cents per thousand cubic feet of gas to consumers for the purpose of creating a special fund to be used only by the company under direction of the commission for extending lines and building compressor stations. The State supreme court, on Feb. 1, 1921, held that this order was invalid, as the commission had no right to grant an increase for the purpose of creating a special fund. The court, however, did not pass on the right of the commission to fix a city gate rate except to hold that the commission has authority under the constitution to fix rates but not for the special purpose named in the order.

The commission announces that it will hear evidence particularly upon waste of gas and leakage. H. D Hancock of Bartlesville, a gas engineer employed by the commission to make tests in connection with this case relative to the leakage of gas at Muskogee and Wagoner, reports that there is a total annual loss of gas per mile of three-inch pipe of 3,834,000 cu. ft. in the lines of the Muskogee Gas & Electric Company at Muskogee and a loss of 3,505,000 cu. ft. per year per mile of three-inch pipe in the lines of the Oklahoma Natural Gas Company serving the Muskogee distributing company.

During a former hearing on the case Samuel Wyer, of Columbus, Ohio, famous gas engineer, testified that $2,500,000 worth of natural gas was lost each year through leakage and waste in transmission to the consumers at Tulsa and that an additional $3,750,000 worth of gas was wasted each year by the domestic consumers of Tulsa, making a total annual waste of natural gas in that city of more than $6,000,000 or enough to build ten big office structures like the Cosden Building every year.

The Oklahoma Natural Gas Company contends that it should not be forced to bear the loss from leakage of lines of local distributing companies but should receive a fixed rate at the city border.

This is one of the most important cases that has come before the Corporation Commission in months and affects the cities and towns of Oklahoma City, El Reno, Enid, Guthrie, Muskogee, Wagoner, Tulsa, Chandler Pond Creek, Claremore, Yukon, Red Fork, Turley, Dawson, Stroud, Wellston, Davenport, Luther, Edmond, Meeker, Arcadia, Kelleyville, Midlothian, Nardin Deer Creek, Depew, Hunter, Lamont, Peckham, Inola, Porter, Ramona, Haskell, Coweta, Shamrock, Sapulpa and Caney.

Oil Shale Activities

Progress Made Toward Solution of Commercial Retorting

By LAWRENCE BOTHWELL

In the November issue of the "American Gas Engineering Journal" of New York City, there appeared an article written by me describing the oil-shale situation in the vicinity of DeBeque, Col., as the representatives of the Independent Oil Men's Association saw it when they visited this district last October. Various retorts under construction, and some in actual operation, were inspected, which were described in the article in detail.

There were also mentioned various interests that have acquired large holdings of oil shale in this district, notably the Ventura Consolidated Oil Fields Company of California (with whom are affiliated the Hammon interests), the Doherty people, generally known as the Cities' Service Company, and others.

Recently the Union Oil Company of California acquired thousands of acres at the head of Parachute Creek north of Grand Valley, and it is generally believed that other large oil concerns are acquiring extensive holdings, the names of the Midwest, Carter, and Continental Companies being frequently mentioned. It is also generally known that the General Electric Company, operating under the name of the "Black Prince," now owns several thousand acres near the head of Big Salt Wash.

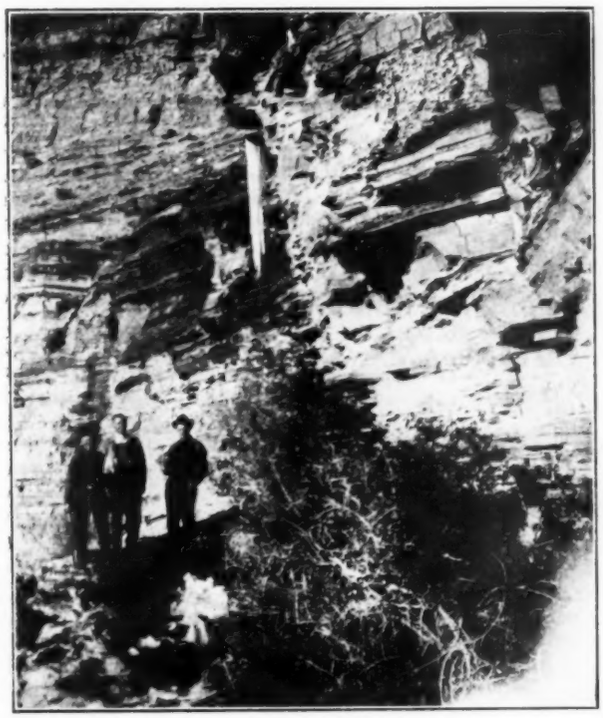
Gasmen generally are greatly interested in the activities of the oil shale field. Mr. Bothwell has written an article that is not technical in any sense but it is the result of what he has observed in the field.—Editor

Before describing other retorts that are being constructed and installed in the DeBeque district, it may be well to describe the shale, its geological history and the present appearance of this wonderful formation.

Ages ago there existed in northwestern Colorado and northeastern Utah a great body of water—an inland sea—of considerable depth which, during later ages, gradually decreased in extent by being filled with eroded matter carried in by streams from surrounding elevations. This erosion, which seems to have been carried in periodically, was deposited over animal and vegetable matter which had accumulated on the alluvium and in the bogs, marshes and swamps. As evidence of this, there is to-day found in the shale formation remains of animal and plant life United States Bulletin No. 691, issued in 1919 by the Department of the Interior and entitled "Contributions to Economic Geology," states that there are found "remains of algae and other low forms of plant life, parts of higher plants (pollen grains, leaves, etc), scales and skeletons of fish, fresh-water shells, insect remains, and even bird remains." After this filling process had gone on for many ages, and the animal and vegetable matter had been sandwiched between layers of erosion, a great upheaval occurred, due probably to volcanic action. In the process of lifting, great crevices were probably formed through which the streams found their way widening and deepening the vents. There are unmistakable evidences of volcanic action. The top of Grand Mesa, towering above DeBeque to the south to an elevation of over 10,000 ft. above sea level, and covering an area of many square miles, is lava. On this beautiful mesa is a chain of over 100 lakes with a supply of trout that should lure those of the most fastidious piscatorial tendencies.

DeBeque is now a village of some 300 inhabitants, located on the Denver & Rio Grande Railroad, a transcontinental line, skirting along the southeastern extremity of the shale mountains. It is the entrance point and gateway to over 200 miles of shale escarpment. DeBeque is a treasure house of curious fossiliferous remains of animals and plants that existed here in prehistoric ages. There is now in the Haley Hotel, resting upon a chair in the lobby, a shale about four feet long, the upper curved edge of which is a clearly defined vertebrae of an ancient animal. In the quaint cabin of our friend "Matt" Callahan is the fossilized form of a mammoth turtle about three feet long. Even its neck and most of its head are still intact. One of its front feet is turned under its body. In the window of the office of Harry Flynn, the president of the Oil Shale Mining Company, now operating intermittently the first unit of their plant at the head of Dry Fork, can be seen slabs of shale with leaves plainly imprinted thereon. And in the office of the Bank of DeBeque are pieces of shale with the forms of fish and snakes on them, the scales of which are strikingly apparent, even the gills being plainly traced. Fossilized fish scales and mussel shells are common and can be found in all parts of the town. But the weirdest and most uncanny specimen is the form of a human face discov-

ered in this region and now in the possession of Dr. W. A. E. DeBeque, the founder of the town. It is quite evident that this was formed by molten lava destroying a human head and assuming its shape as it was moulded in the clay. It is a sort of death mask, and the effect is striking. How can a man hold this object in his hands, look at the lips clearly defined, the wide and high-bridged nose, the retreating forehead, the prominent chin, the high cheek bones, the vacant and jagged eye sockets, and not be possessed of a strange feeling as there dawns upon him some conception of the ages and ages that have gone by since this being lived and roamed the region here?



Near view of an escarpment north of DeBeque, Col.

Does it take much of an imagination to conjure up the picture of a human being in the long ago—yes, hundreds of thousands of years—standing upon the edge of a great inland sea, gazing out upon its placid waters, with the fish, turtles, and reptiles of every nature and description abounding under its surface, with the birds flying about, and the animals grazing upon its shores—a place where to-day great mountains touch the sky and valleys rich in bounteous nature's golden harvest lie between? And does it take much of an imagination to look into the future and see cities nestling in these same valleys, and great industries droning and humming away, taking from the very place and scene that lay before this prehistoric figure a fluid that makes for human comfort and progress?

Thus to-day we find in northwestern Colorado and northeastern Utah the great "Uintah Basin," approximately 175 miles long and 50 miles wide, which contains mountains made up of the bottom of this ancient sea. In the southeastern part, that is to say, in the DeBeque district in Colorado, practically the upper halves of the mountains are shale, which, when subjected to heat, will produce gas made up principally of carbon and hydrogen, and these uniting by condensation will be oil. And when I say "oil" I mean all its refined products, such as gasoline, kerosene, lubricants, paraffin wax, etc., and by Government test even superior to the products of the best paraffin subterranean oil. Government Bulletin 641F, issued several months ago, contains a prefatory statement that is startling indeed:

Government Statement

> The United States Geological Survey has demonstrated that the shale in the Green River formation will yield a vast quantity of oil, gas sufficient to carry on the process of distillation, and fertilizer enough to enrich the most of the farms of the Middle West, and that this reserve is ready whenever the demand is sufficient to warrant the establishment of a new industry to supplement the failing supply of petroleum from the oil fields

At the time of writing the article for the November issue above mentioned, a new company was not named for the reason that it had not yet come upon the scene. This is the Index Shale Oil Company, which is installing the "Brown process" constructed by the Shale Oil Machinery & Supply Company. H. A. Hanson, Mayor of DeBeque, originally acquired the holdings and is heavily interested in the company. On February 20, I visited the property of the company and was astonished to find the progress that had been made within the past two months. The plant is being installed upon what is known as Mount Blaine, one of the best shale sites in this district. Their property, consisting of over 800 acres, is located at the junction of the Roan and Clear Creek Roads. The shale escarpment begins about 1,500 ft. above the valley floor and extends upward in a sheer precipice some 800 ft. presenting a shale face of extraordinary appearance and proportions.

The plant site is located on a knoll some 800 ft.

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Distant view of shale face as seen from the line of the escarpment, near DeBeque, Col.

Advantages of Three-Charge System

What the Past Year Has Developed in This Connection

By J. E. BULLARD

The industrial depression through which we have just passed, or at least which conditions indicate we have practically passed, have demonstrated the advantages of the three-charge rate system in a way they have never been demonstrated before. In fact, in some cases they have proved the sole salvation of utility companies.

At the beginning of this depression, many a company found itself in a more serious financial condition than it had ever been in before. Unlike most business enterprises, the gas and the electric companies have not been able to pass the higher costs of operation on to the consumer by the simple medium of increasing selling prices. Commissions having control of rates have been slow in approving rate increases. Probably no companies have been able to increase rates to an extent that would make these increases meet all increased costs.

It is not claimed by Mr. Bullard that the three-charge system can be used by all companies, but he does assert that those companies which have adopted this method have found it exceedingly satisfactory. At any rate Mr. Bullard has written an interesting and instructive article.—Editor

In addition, the great increase in business that resulted from the war has in many cases made it necessary to make expensive additions to plant or distribution system, if not to both and often the money for these improvements has been secured at high rates of interest. When the mills and factories began to reduce production or to shut down altogether they also began to reduce the consumption of gas and electricity though the fixed charges of the gas and electric plants continued as before. The only possible saving was in operating costs and usually this was so small as to be almost negligible.

When a company sold its output on a flat rate system or a discount system, the revenue fell off to a very serious extent. Unless the company had a large emergency fund out of which to meet current expenses it became a problem to keep going at all. Still it was not easy to secure rate increases, especially since prices were already beginning to come down.

No gas manager needs to be reminded of all the difficulties he has been called upon to face. Out of all this, however, there has come some goods. In some instances, the candle-power requirement has been waived and the heat unit requirements have been lowered, permitting the gas to be made at a lower cost. It is also likely that it will be very much less difficult to put into operation a three-charge system of rates than it has ever been before.

Three Charge System in Electric Plants

Just what a three charge system means has been demonstrated by some electric plants that have made just as much money and in some cases more when the industrial plants in town were shut down as they did when they were operating full blast. At the same time the industrial plants have not suffered because if they had not purchased their current they would have had to generate it themselves and the fixed charges on their own plants would have amounted to more than they paid the electric company

At the same time, these fixed charges have not been passed on to the average consumer who is not nearly as well able to pay it as the industrial plant and who would have been forced to pay it, if the industrial plants had not and the electric company was to continue in business. In other words, the readiness to serve charge has worked to the benefit of all concerned. It has been cheaper for the industrial plant to buy its current under this system than it would have been to generate the current on the premises It has made the fixed charges lower in the case of shut down than they would be in the case of an isolated plant. It has protected the electric company from losses beyond its control when industrial plants shut down but the company had to continue doing business. It has made it possible to charge the lowest possible rates to all consumers.

A flat rate system would have forced many of these companies out of business. If it had not done so it would have been necessary to have increased rates a hundred per cent or so in order to meet expenses, and it is not an easy matter to show any commission that such rates are necessary. In fact, when conditions once more became normal they might not be necessary.

Public utility companies are not allowed to conduct their business on a strict profit-making basis. That is, they are not allowed to make all the profits that

(*Continued on page* 347.)

Removal of Sulphur Compound*

What the Laboratory Tests Show

By ERWIN C. BRENNER

This paper is presented as a final report on work done during the scholastic year 1919-20 in connection with the fellowship of the Wisconsin Gas Association in the Chemical Engineering Department of the University of Wisconsin.

The preliminary report presented gave a brief resume of the literature on methods of sulphur removal; it also gave the limitations of the present iron oxide process and of the various other processes proposed and in operation. With the exception of the iron oxide process, but few of the other processes are applicable to present-day gas plant practice without extensive changes in equipment and in operation. From a consideration of these limitations an ideal process would be one having the following qualifications:

> The process must be sufficiently elastic to cope with big fluctuations in gas production, or large increases in the sulphur content of the gas.
>
> The process must be applicable to both large and small plants without considerable change in present equipment or practice.
>
> The cost of such an installation and of its operation must be small.

The oxide process does not deal adequately with sulphur compounds other than hydrogen sulphide, nor does it remove hydrogen sulphide with the same speed as a wet process. It seemed worth while, therefore, to make a study of wet purification processes after consulting with some of the officers of the association. This report deals with the investigation of hypochlorites as agents for the oxidation of sulphur compounds in carbureted water gas.

Theory

In the iron oxide process, the oxidation of the principal sulphur compound found in commercial gas—namely, hydrogen sulphide—as generally accepted, takes place according to the following equations:

$$Fe_2O_3.... \quad H_2O + 3H_2S = Fe_2S_3 + 4H_2O$$
$$2Fe_2O_3.... \quad H_2O + 6H_2S = 4Fe_2S + 8H_2O + 2S$$
$$Fe_2O_3....3H_2O + 3H_2S = 2Fe\,S + S + 6H_2O$$

Under ordinary conditions, but small amounts of carbon disulphide are removed from the gas by this process.

In this connection, Ritsema calls attention to the fact that hypochlorite solutions oxidize carbon disulphide as follows: $CS_2 + KOCl + KOH = K_2SO_4 + K_2CO_3 + 8KCl + 3H_2O$. This, then, would be oxidizing carbon disulphide to a sulphate. This property of potassium hypochlorite is due to its available oxygen content, and is common to other hypochlorites, as, for example, bleaching powder or so-called chloride of lime [$Ca(OCL)_2$].

Ritsema, however, does not mention what concentration of hypochlorite is necessary to carry out the above reaction, nor does he mention whether the reaction will take place when carbon disulphide is present in gas in but small amounts. He also does not mention the effect of hypochlorites on hydrogen sulphide. Hence a laboratory investigation was made to determine whether hypochlorite solutions could be used to remove sulphur compounds from the carbureted water gas which was available.

Preliminary determinations were made on pure hydrogen sulphide, using a calcium hypochlorite solution (bleaching powder) having about 3.5 grams of available chlorine per liter. Hydrogen sulphide, generated in a Kipp apparatus by the action of hydrochloric acid on ferrous sulphide, was bubbled through 200 c.c. of this solution in a 500 c.c. absorption bottle. It was found that when gas was passed through at a rate of about 0.5 cu. ft. per hour no hydrogen sulphide could be detected at the outlet of the bottle with moist lead acetate paper, though the distance the gas traveled through the solution was only 2 in.

Carbon dioxide was then passed through a further quantity of the same solution to determine whether carbon dioxide will displace chlorine from combination. Though pure carbon dioxide was passed through the solution for thirty minutes at the rate of 0.5 cu. ft. per hour, no chlorine could be detected at the outlet of the absorption flask. Hence carbon dioxide will not displace chlorine from combination so long as the solution is alkaline. An analysis of the hypochlorite solution after passage of carbon dioxide showed no loss in available chlorine.

Hydrogen-Sulphide Removal Experiments

An investigation was then made to determine the value of hypochlorite as a means of removing hydrogen sulphide from a hydrogen sulphide and air mixture. In these experiments it was decided to use a sodium hypochlorite solution in place of the calcium hypochlorite solution of the preliminary determination. The sodium hypochlorite solution used was prepared by electrolyzing a 10 per cent common salt (sodium chloride) solution in a "Valhalla" cell. The hypochlorite thus obtained had as a maximum 5.4 grams of available chlorine per liter.

In the first of these determinations the amount of hydrogen sulphide in the gas was varied from 60 grains per 100 cu. ft. to 6 per cent, and the quantity of sodium hypochlorite used was 1 liter having 2.035 grams of available chlorine per liter. It was found that for all dilutions of hydrogen sulphide the efficiency of removal was about 95 per cent when using one-tenth cubic foot of gas, but that the amount of chlorine lost by the solution was considerably in excess of that necessary to completely oxidize the hydrogen sulphide present. The rate of passage of the gas was about 0.5 cu. ft. per hour.

*Paper read before Wisconsin Gas Association meeting.

The results thus obtained are shown by the following table:

Run	Grains H_2S/100 c. f. Before	After	% H_2O Removed	Grains Avail. Cl/L Before	After	Per cent Chlorine Removed
I	4,100	1,230	70.1	2.035	0.345	83.00
II	2,198	483	78.0	2.035	0.795	61.00
III	1,001	80	91.2	2.035	1.140	44.05
IV	380	8	98.1	2.035	1.759	13.60
V	60	2	97.0	2.035	1.761	13.50

In each of the above determinations the hypochlorite solution after passage of the gas showed a distinct cloudiness due to precipitated sulphur. Evidently oxidation in part takes place according to the following equation: $2H_2S + O_2 = 2H_2O + 2S$, which equation, using sodium hypochlorite as an oxidizing agent, would become: $H_2S + NaOCL = H_2O + NaCl + S$.

An analysis of the gas after having passed through the hypochlorite solution showed the presence of free chlorine. To prevent this loss of chlorine the hypochlorite solution was made strongly alkaline with caustic soda and the determinations above repeated. It was found that a hypochlorite of the same available chlorine content, but having an alkalinity of 2 per cent sodium hydroxide, completely removed all hydrogen sulphide and prevented any escape of free chlorine. The amount of gas passed through the train was 0.1 cu. ft. at the rate of 0.5 cu. ft. per hour. Some sulphur was precipitated as before, but it was soon dissolved in the sodium hydroxide present.

Since hydrogen sulphide is readily absorbed by concentrated alkali, no determination of the per cent of hydrogen sulphide removed by the hypochlorite was possible. Alkali of the above concentration will also remove a great part of the carbon dioxide contained in the gas, and hence make an absorbent of this kind valueless as a gas-purifying material where the amount of carbon dioxide is high. Hence a number of determinations were made, using a hypochlorite of varying alkali content. At the same time the amount of carbon dioxide removed by the alkali from a hydrogen sulphide, carbon dioxide and air mixture was determined. The results obtained are shown by the following data:

Det.	Gm. NaOH per L.	% CO_2 Before	% CO_2 After	% CO_2 Removed	Rate of Flow
1	10.20	6.32	2.66	58.0	0.5 cu. ft. hr.
2	8.85	6.32	3.73	41.0	0.5 cu. ft. hr.
3	7.25	6.32	4.86	23.0	0.5 cu. ft. hr.
4	6.32	6.32	5.51	13.0	0.5 cu. ft. hr.
5	5.85	6.32	5.74	9.1	0.5 cu. ft. hr.
6	4.17	6.32	5.98	4.3	0.5 cu. ft. hr.
7	2.07	6.32	6.24	1.2	0.5 cu. ft. hr.

To determine the ratio of available chlorine consumed to hydrogen sulphide removed, a determination was made beginning with 1 liter of hypochlorite solution and passing a hydrogen sulphide, carbon dioxide and air mixture through it. At intervals 25 c.c. samples were removed from the absorbent and analyzed for available chlorine and alkali content. The per cent carbon dioxide absorbed by the alkali was also noted. The results of the determinations are shown by the following table:

	% H_2S	Gm. per 100 cu. ft.	% CO_2	Gm. Cl. available per L.	Gm. Cl. present	Gm. NaOH per L.	Gm. NaOH present	Gas to Absorbent: Cu. ft.	Gr. H_2S	Gm. CO_2	Gm. Cl. remaining	Gm. Cl. consumed: Consumed	Gm. = H_2S	Ratio H_2S absorbed: H_2S = to Cl. used	% of CO_2 absorbed	Rate of flow, cu. ft. per hour	C.C. of absorbent
A	0.2953	181.0	5.68	2.845	2.845	10.25	10.25	0.3	0.0351	0.866	2.626	0.219	0.105	33.4	35.5	0.72	1000
B	0.2953	181.0	5.68	2.626	2.580	9.84	9.59	0.2	0.0234	0.578	2.494	0.086	0.0413	56.6		0.82	975
C	0.2953	181.0	5.68	2.558	2.43	9.76	9.28	0.3	0.03505	0.867	2.32	0.11	0.0529	66.3	65.0	0.72	950
D	0.2953	181.0	5.68	2.44	2.259	9.58	8.86	0.3	0.03505	0.867	2.075	0.184	0.0884	39.7	46.0	1.51	925
E	0.2953	181.0	5.68	2.245	2.020	9.1	8.19	0.3	0.03505	0.867	1.825	0.195	0.0937	37.4		1.02	900
F	0.390	245.6	5.4	1.935	1.645	8.84	7.51	0.3	0.0462	0.824	1.507	0.138	0.0665	69.5	58.5	0.945	850
G	0.390	245.6	5.4	1.771	1.462	8.57	7.06	0.3	0.0462	0.824	1.427	0.035	0.01683	275.0		1.30	825
H	0.390	245.6	5.4	1.73	1.383	8.32	6.65	0.3	0.0462	0.824	1.092	0.291	0.140	33.0	33.8	1.07	800
I	0.390	245.6	5.4	1.365	1.059	7.66	5.94	0.3	0.0462	0.824	0.890	0.149	0.0717	64.5	25.6	1.63	775
J	0.390	245.6	5.4	1.15	0.862	7.65	5.74	0.35	0.0539	0.961	0.626	0.236	0.1136	47.5	24.0	1.51	750
K	0.390	245.6	5.4	0.835	0.605	7.39	5.35	0.3	0.0462	0.824	0.412	0.193	0.0929	49.8		1.00	725
L	0.390	245.6	5.4	0.569	0.398	6.44	4.5	0.3	0.0462	0.824	0.227	0.171	0.0823	56.1	15.5	2.0	700
M	0.390	245.6	5.4	0.3245	0.219	6.48	4.37	0.3	0.0462	0.824	0.048	0.171	0.0823	56.1	11.9	1.63	675
N	0.390	245.6	5.4	0.0706	0.0459	5.94	3.86	0.193	0.0297	0.530	...	0.0459	0.0221	...		1.7	650

The column labeled "Hydrogen sulphide equivalent to grams of chlorine" was calculated on the basis of the reaction: $H_2S + NaOCl = NaCl + H_2O + S$; and hence the values of this column also enter into the calculation of the column labeled "Ratio of $\frac{H_2S \text{ equivalent}}{H_2S \text{ absorbed}}$ to chlorine consumed."

The results of this determination hence show that more chlorine is consumed than is combined with the hydrogen sulphide of equation above.

.....Conclusion.....

The results in general of this series of determinations show:

That sodium hypochlorite in aqueous dilutions as low as 0.0706 gram of available chlorine per liter is capable of completely removing hydrogen sulphide in a gas by bubbling it through but 3 in. of the liquid.

That a loss of chlorine by the hypochlorite solution can be prevented by making the solu-

(*Continued on page* 348.)

American Gas Journal

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As the Journal Views It

The Outlook

Business men, generally, are optimistic over the outlook for the coming months. They seem to feel that conditions in the country are righting themselves and that the so-called "buyers' strike" has ended and the public is once again coming into the market and replenishing their needs.

When business again resumes its pace everybody is going to be busy, but unless the implements of commerce are at hand lots of people are going to lose orders. That is one reason why the AMERICAN GAS JOURNAL has been hammering away at the question of buying now. No one can tell just when the big spurt is coming. To-night you may retire with business going in its usual pace and to-morrow morning you may find that orders are beginning to come in in the same old way.

During the war we heard much about preparedness and what the lack of it meant but it applies just as much to the business field as it did or does to the military activities. If a company or dealer lacks the necessary stock with which to supply his customers then he is going to lose those customers and business is going to continue bad with him.

From talks that we have had with appliance manufacturers we know of the spirit of co-operation that exists in that branch of our business and of their willingness to help out gas companies and appliance dealers generally. But have the companies displayed their willingness to help? That is for you to decide. The only thing that we can do is to urge that you place your orders now for the goods that you surely are going to need and then start out and sell those goods. It's a simple enough thing and all it requires

is just a little push. We believe thoroughly enough in our industry to have confidence that gas companies and dealers generally need only to be shown the way to start a campaign.

Public Policy

From time to time we have discussed public policy and have advocated "pitiless publicity" as at least one cure for some of our ills. It was only recently that a gas man told the story of the fight that his company had been making for a fair rate but which had not met with any great success. It was not until in desperation the gasmen turned to the public that any action was secured, but then it came mighty fast. After the battle was over it was frankly admitted that the mistake that had been made was in not taking the public into the confidence of the company in the first place. It was felt that if this had been done it surely would have resulted favorably without the long drawn out contest.

Building good-will is as much a part of the business of the gas company as is the manufacture of gas. Without it either the company or those in charge will fail, and with it there is no limit to the heights that can be climbed. But treating with the public is a dangerous business unless an expert is employed. The public is fickle and can be swayed easily either for or against a proposition. Sometimes the advocate for a proposition by his very actions will defeat his own end.

One of the sure ways of bringing defeat to a campaign is for hypocrisy to be practised. Don't say one thing, mean another, and do still another. This is the quickest way of bringing down wrath that we know of. For the time being this course may seem to be all right but eventually it will result disastrously for the company. Don't make any announcement until you are sure that you mean just what you are going to say, but having given your word live up to it. This course will work to your advantage in the long run.

We know of a case where the management of a company declared one thing for public consumption and very promptly did the exact opposite. To-day that management cannot understand what has happened to its proposition which seems to be on the brink of failure. But if an analysis is made and the truth learned that management will quickly learn the trouble.

So build good-will, but watch your step.

The Labor Situation

What of the labor situation in your company? Has it improved recently or are you still experiencing the difficulties that you had to face during the war? There is an adjustment taking place all over the country for the cost of living has fallen and in the natural course of events the wages of labor must come down to meet this reduction. But the cut need not be drastic. It can be placed in effect gradually and in such a way that those whose wages have been increased the slightest will have to make the smallest reductions.

In making this reduction there is going to be met some opposition on the part of the agitators who are always with us, but we believe the rank and file of the laboring men are willing to meet their employers half way and to cut their wages. As to the agitators they are not going to be satisfied no matter what takes place so they need not be considered. If they are unwilling to play the part of Americans and do their share in building the country then the best thing that can be done is to eliminate them from consideration.

There are some classes of labor that cannot be cut to any very great extent. This principally applies to the clerical workers. From observation it would seem that they received the smallest advances of any during the period of inflation and it is rightful that they should be the last to receive a cut. Of course, this is not going to meet with the approval of the other departments, where shipyard wages have been paid, but there is justice in this world, and we believe that justice should be done to the office workers. But even here there is some adjustment that can be made and it should be made. Gas companies, even those which have been fortunate enough to receive small increases in rates are not yet out of the woods and so every economy should be practised not only by the company but by those it employs.

A Splendid Plan

The action of the joint convention of the Pennsylvania and New Jersey Gas Associations in deciding to establish a conference with surrounding States for the promulgating of the truth about our industry is decidedly a step in the right direction. We predict that great good will result.

The conference will be in close touch with the situation in the various allied States and will be able to take prompt action where it is most needed. In addition to this greater interest will be aroused among the member companies of the associations because they will be able to see just what is being accomplished in the various States.

It is to be hoped that there will be no delay in getting the work started for this is the most advantageous time for telling the truth about our industry. The organization that must be perfected in order to carry out the plans of the convention should be started at once and within a short time should be functioning smoothly.

Other sections can well study the plan as outlined in another part of this issue of the JOURNAL, for it is possible to put it into effect in many other parts of the country.

Credit for originating the plan goes to the membership committee of the Pennsylvania Gas Association and the JOURNAL wishes to congratulate the members of this committee on their work.

Inside Story of 60 Cent Gas in Indianapolis

(*Continued from page* 335.)

much more rapid depreciation and that in varying degrees.

The depreciation charge in 1919 was only $73,000, whereas that in 1920 was $224,000. As was explained before the commission, of the charge made in 1920 $75,000 was made in the early part of the year 1920 by order of the board of directors, and was on account of the year 1919, the actual charge not having been made in the year 1919 because of the surplus account of the company being such that it was not prudent to set up such a charge in the year 1919; but as a matter of fact when charged against the year 1919, it made a total depreciation charge for that year of $148,000. This brings the depreciation charge for the year 1920 to approximately a like sum, which we believe is a fair annual depreciation charge on the entire property of the company, which was of a value (including the leased property) in 1920 considerably in excess of $12,000,000. The total depreciation reserve accumulated to Jan. 1, 1921, amounted to $1,040,302 as against which charges for replacements amounting to $238,139 had been made, leaving a balance of $802,000, or about 6 per cent of the value of the company's property that is subject to depreciation. When averaged through the various years against the property value existing in those several years as reflected in the outstanding securities, it will be found that the depreciation reserve is somewhat less than at the rate of 1½ per cent per year and the charges to depreciation for 1919 and 1920 averaged only about 1.1 per cent per year of the value of the property.

There was also shown before the commission the fact that the average amount payable on the company's securities, including dividends upon its stock and interest upon both its 5 per cent and 7 per cent bonds as outstanding Jan. 1, 1921, amounts to 6.58 per cent, as shown by the following table:

Securities	Par Outstanding Jan. 1, 1921	Average Sale Rate	Cash Realization	Annual Charge	Average Interest Rate
Capital stock	$2,000,000	120.93	$2,418,711.29	$200,000	8.26
First and refunding bonds	2,923,000	93.63	2,737,020.00	146,150	5.31
General mortgage bonds	1,302,000	90.40	1,177,008.00	91,140	7.74
Totals	$6,225,000	101.73	$6,332,739.29	$437,290	6.58

The fact that the company has never paid any higher average rate than this (and during the years preceding the issuance of the 7 per cent notes, the average rate was much less), and that in spite of this practically no surplus whatever has been accumulated during the entire twelve years of the company's operations, is a complete demonstration and proof that the company has not had excessive earnings nor has it paid excessive capital charges. Indeed, the only conclusion to be drawn is exactly the opposite.

Has Had Only Two Good Years

As shown by the audit of the company's accounts made by the commission, the company in all its history has only had two years which could be called fairly good years, that is the year 1916 and the year 1920. The results of the year 1916 were due entirely to the abnormal earnings derived from the operation of the benzol plant, and of the year 1920 to the coke earnings and earnings of other by-products, plus the amount derived from the settlement of the Government contract.

At this point a word should be said as to the actual results of operations of the business, taking the years 1919 and 1920 together. It was developed on the hearing that the only thing that saved the two years taken together, even though 1920 was, as a whole, a very good year, from being disastrous to the company, was the effect of the Government settlement which brought into the company's operating income about $519,000. This was in no sense due to operations and cannot be used as a guide in any sense for what the earnings of the company will be in any other year of its operations. We wish to analyze what would have been the results of the two years, without this fortuitous settlement. The total surplus of the company, available for depreciation and other reserves and dividends, including the amount received on account of the Government settlement, for the year 1919 was $271,927.38 and for the year 1920 $414,977.61; this after all fixed charges have been paid, but before any sum had been set aside for depreciation or for dividends. If we should even add to this total the amount of the write-down of inventories at the end of the year 1920 (as to which we will speak more fully hereafter) and the charging off of obsolete materials, the total net profits or surplus of the two years including the amount received from the Government, available for depreciation, dividends and contingencies was $943,872.65. Deducting from this total the amount received from the Government, to wit, $519,456.35, leaves a balance of $424,416.30, which would have been the entire amount available for depreciation, dividends and contingencies, even if there had been no write-down in the inventories. With the amount written down on the inventories subtracted, the balance available for depreciation and dividends would have been $167,448.64, and with the depreciation charge for the two years subtracted, instead of there being any sum available for dividends and surplus, there would have been a deficit of $130,202.78 in the operations of the company.

Method of Pricing Coke in Stock

The method pursued in pricing the coke in stock, amounting to some 15,000 tons, including breeze, was clearly set forth in the letter of instructions furnished to the auditor which has been placed in evidence and which was read to the commission, and carried conviction as to the propriety and soundness of the method adopted of arriving at values. We wish to quote from that part of the letter of instructions of Jan. 19, 1921, dealing with the fixing of coke prices:

"For the prices used in valuing the coke at Dec. 31, 1920, take as bases the average prices realized on

the actual shipments of coke during the first eleven days of January. In the case of coke on cars awaiting shipment these prices are applied, so far as commercial coke is concerned. In the case of coke breeze on cars awaiting shipment (to company's power plants), the price will be 75 per cent of the cost at our plants of Indiana coal purchased for steam purposes, as indicated elsewhere.

"Coke in bins awaiting loading for shipment or direct disposition will be priced for inventory purposes at 25 cents per ton under the prices used on the foregoing class, the reason for this discount being that a considerable cost for loading and switching will be involved.

"Coke in the last class, namely, that in stock piles to be carried for a considerable period and afterwards reclaimed, will be valued at $1 per ton under the prices used for coke on cars awaiting shipment. Two exceptions will be made with respect to prices in this class: (1) Due to scarcity of orders for shipment of chestnut coke to more distant points, the average selling price of chestnut coke shipped during the first eleven days of January is abnormally above the average for egg coke. Under ordinary circumstances the chestnut coke is less in demand and will average a somewhat lower price. Therefore, after applying the average egg coke price of the first eleven days of January to the egg in stock piles, as just indicated, the price to be put on the chestnut coke in the stock piles should be 25 cents per ton under the price placed on the egg coke, instead of being simply $1 per ton first eleven days of January. (2) The coke breeze in under the average sales price of chestnut coke for the stock piles should be valued at 50 cents per ton under the price which is arrived at for coke breeze on cars awaiting use at the power house, instead of $1 under that price, for the reason that the cost of handling the coke breeze on reclamation is less than the cost of handling the commercial coke. With these modifications, it is estimated that the cost of removing from stock and of passing through the screening equipment and of loading and switching for shipment will be approximately $1 per ton.

"The coke which is on cars or in bins awaiting stocking should be valued for inventory purposes at 50 cents per ton under the prices used for coke in stock piles, this being approximately the cost of placing the coke in stock."

The attention of the commission is called to the earnings statement of the first two months of the year 1921 and to an analysis of the same. This statement is made up in the usual form and is based on a value of $6.868 per ton for a stock of 107,850 tons of coking coal on the ground or on cars in the city at February 28, this average price having been reached in the manner explained above, and comparing with an average of $6.238 per ton for the coal in stock on December 31. The statement covers also a total stock of 68,081 tons of commercial coke and coke breeze in stock or on cars at the end of the month awaiting placing in stock, at an average price of $10.45 comparing with an average price used on Dec. 31 of $7.75. With these higher values for these inventories the company still showed a deficit for the two months amounting to $21,950.76 before making any charges for depreciation and amortization. The valuation of these inventories at the figures used Dec. 31, 1920 would, of course, make such a change in the result as would indicate clearly what the actual business situation of the company for the first two months of 1921 has been, and accordingly we call your attention to such an analysis.

Analysis of Earnings Statement—First Two Months of 1921

Net Deficit after operating expenses, taxes, rent and interest	$ 21,950.76
Regular monthly depreciation and amortization charges	24,889.98
Total book deficit	$ 46,840.74
Adjustment of value of 107,850 tons of stock coal from $6.868, the price used at February 88, to $6.238, the price used at December 31, would increase the deficit by	67,900.64
Adjustment of value of 68,081 tons of stock coal from $10.474, the price used at February 28, to $7.723, the price used at December 31, would increase the deficit by	187,336.19
Making a total deficit for two months of	$302,077.57

It will thus be observed that the gas company during the first two months of the year, following its usual accounting practice, shows a book loss of $46,840.74. But in order to obtain a statement which will fully reflect the disastrous business conditions of the period covered, it has been necessary to make an adjustment of the two large inventories as indicated above, and on doing this we find that the business of the two months resulted in a deficit of $302,077.57. The deficit shown by such an analysis of the report is in entire accord with that shown on the preliminary January statement and which may therefore be taken as a true reflection of the company's business conditions for the month of January.

From a practical financial point of view, the situation of the company at the present time is more unfortunate than even this analysis of its statement for the first two months of 1920 would indicate, for at the present time (and this condition must continue until next winter) all of the coke which the company carries in stock must be considered as a dead asset. In other words, although in time it will undoubtedly be converted into cash at some figure, for the present it is not a liquid asset in any helpful sense. It must encumber the plants for six or eight months, and even at the close of that period, it will be impossible to liquidate the coke stock from the larger plant to any great extent unless the company can build a large new screening plant. Such value as it has must necessarily be speculative so long as there is no prospect of a demand for coke which will absorb even the reduced current output of the plants during the coming summer.

We wish to bring before the commission the cash condition of the company. It has outstanding $800,000 of bank loans running for a period of three months: it has trade acceptances of $360,000, which are not subject to renewal, and its other current accounts payable on March 1, 1921, were $297,206.57 and its accounts receivable $350,149.38. Wholly aside from the need of making provision for the above $1,160,000 of the above obligations which are in addition to ordinary accounts payable, the company must be pre-

pared on or before May 1 to raise approximately $500,000 to meet $302,000 of its general mortgage bonds due on that date, to pay interest of $45,570.00 on its $1,302,000 of general mortgage bonds then due and to meet $143,963.92, being the first installment of its 1921 taxes. The company is in urgent need of constructing new coke screening equipment to take the place of that destroyed by fire last September. The temporary makeshift screening which has been installed is not only inadequate but it does the work of screening very imperfectly, and the need of the company to reclaim from stock the large amount of coke which has been and will be stocked, will place such burdens on the screening appliances next fall. as to make it imperative that adequate and efficient screening apparatus be installed. The estimated cost of the new screening equipment is from $200,000 to $250,000. The need of main extensions recur each year and the cost of these each year, with necessary services and meters, aggregate not less than $110,000. A new gas holder is urgently needed and has been insistently demanded by the city, and the company only awaits the procuring of the necessary funds with which to erect the same with the consequent improvement of its service. The cost of such a holder will be approximately $500,000. Without attempting to pick out other improvements and changes which are urgently needed, the foregoing items are entirely sufficient to present the present financial needs and to show the imperative necessity for some kind of new financing.

Does the Company Need Relief?

With this background and history, into which we have woven more or less of discussion, we come to the consideration of the real question which is, has the company presented a showing of the necessity of emergency relief in the form of an increase in the rate charged to consumers of gas? That it has done so we believe is completely demonstrated by the following matters:

That there is an industrial depression of almost unprecedented depth, is we think, without doubt. The depression is widespread; it has continued for a number of months and while it may have reached the bottom, little if any progress has been made toward recovery and that the extent of the recovery, as well as the time within which that recovery may be expected, are matters of great uncertainty but nevertheless of deep concern.

The vital relation of the income of the petitioner to industrial conditions is clearly developed. We have shown how the whole reason for cheap gas is found in the profits derived from the sale of coke and other by-products. The demand for these products has almost wholly ceased. The coke demand is less than one-fourth what it was last fall. The ammonia demand is not only greatly diminished, but the price is 10/14 of what it was last year. The benzol plant is being operated at an actual loss. The market value of the company's coke placed in stock is on the average 20 to 25 per cent less than the cost of the coal alone which enters into it.

The company even with a return of business activity, will be deprived of the large support which it has had for five years from its benzol plant. The evidence shows that during the last two years, the total net benzol earnings, other than those derived from the Government settlement, have been about $25,000 or $28,000, or at the rate of a little over $1,000 a month. When it is considered that the benzol operation during the last five years contributed more than $200,000 per year, on an average, to the net profits of the company, it is beyond question that some provision must be made for the difference between $200,000 per year, the past average of profits from the benzol plant, and $1,000 per month, which is a fair average to be assumed for the future.

This then is the conclusion of the company. It has absolutely no selfish purpose to serve. Its directors and officers have not sought their present positions and have no desire to maintain them, except as and so long as a matter of public duty may be involved which they feel they may not honorably relinquish. The company is in a very real sense a public servant. From one standpoint, it might be said that its directors are indifferent, so far as their personal affairs are concerned, as to whether it receives any increase of rates or not, and thus as to whether it is able to go on and discharge its duties, but in their sense of duty to the community, they feel and know that it is imperative for the company to have additional income if it is to live and fulfill its public duty. The commission has seen the character of its directors and trustees and will judge for itself whether they are endeavoring to serve the community or some selfish end in this proceeding.

With a 90-cent gas rate we will still have, with possibly one exception, the cheapest artificial gas rate in the country and much below that prevailing in the other cities of Indiana.

Of Mutual Benefits

Mutual are the benefits that are being sought—and that are really being accomplished—by the Logan Natural Gas & Fuel Company in their campaign for gas conservation.

When we say "mutual benefits" we have in mind the company and the consumers. The company benefits by increased business and increased income if it succeeds in showing the people how to use natural gas economically, for the people already know by long experience the great convenience and efficiency of gas for heating and cooking.

It should not be impossible or difficult to induce people to economize in the use of natural gas when they know so well of its convenience, find that it can be used at a comparatively low cost and that the life of the supply depends on their helping to conserve it.

The company is doing a work in their demonstrations that is proving a real public benefit and is entitled to a fair return on the investment involved in the service – a service which promises to be good and to last long if carefully and wisely used by the consumers.

Kings County Lighting Co. Bonds

On the application of the Kings County Lighting Company, the Public Service Commission has modified its recent order permitting the company to issue $2,000,000 in stock, and authorized it instead, to issue bonds for 1,152,000. The bonds will be issued under its refunding mortgage, of which the Central Trust Company is trustee, and the proceeds will be used to pay for the cost of improvements for which the capital stock was to be issued. The present condition of the money market was given as the reason for the modification of the order.

Oil Shale Activities

(*Continued from page 337.*)

above the creek and is reached by a splendid road of a mile and three-quarters in length and all easy grade. This is considered the best private road in this field.

I found, upon reaching the camp site, which comprises some ten acres, that four buildings have been completed, one a bunk house that will accommodate twelve and another four people, and a mess house with living quarters for the cook and eating and kitchen facilities that will accommodate twenty-four people. I also found a carpenter shop and store room. There are two buildings under construction. one a three-room dwelling and the other a forge and blacksmith shop. On the top of the knoll was a water tank filled with water supplied from springs a mile away. These springs are on the company's property, and are inexhaustible. I visited their pump house and sump and found a six horsepower engine and a double-action pump. The sump consisted of an eight by twelve reservoir six feet deep under the pump house. The water is diverted from the springs through this house, running through the sump and down the ravine into the valley. A two-inch pipe has been carefully laid between the pump house and the water tank and is buried below the frost line and protected across the draws by box viaducts.

On the southern slope of the camp site there is an extensive excavation for the retort building. The concrete retaining wall between the retort room and boiler and engine room has just been completed, it being about 100 ft. long and about 25 ft. high. Near this retaining wall was the retort proper, which is to be in place as soon as the forms for the retaining wall are taken away. The retort was lying within the excavated part of the slope in three separate sections, each consisting of steel cylinders. It is of a horizontal revolving type made in three units or sections, each section being twenty feet long and thirty inches in diameter. These are united so as to make it continuous by means of stuffing boxes which enable each unit to be driven individually. Within these sections is welded a spiral fin which, with the revolving of the section, creates an internal worm that will cascade the shale through these units, which, the three in combination, will make a retort over sixty feet long. At each stuffing box there is provision made to draw off the educted vapors by means of suction as soon as they are liberated from the oil shale, thus preventing any overheating or cracking. By this fin being welded to the shell of the retort the speed by which these revolve will regulate accurately the time which the shale is subjected to the heat, for along each one of these units there is an individual furnace constructed of fire brick and heated by combination oil and gas burners. It is easy to see that through the automatic regulation of the furnace temperature and the speed of the individual units temperature and time elements of this eduction process are evenly governed. The retort house will be 500 ft. above the next lower elevation on the side of the mountain. Upon this elevation will be located the storage tanks, which will be reached by means of an air-cooled condensing apparatus. The educted vapors from the retort will be forced from the pipe lines and there the oil will be condensed and the fixed gases will be returned to the retort room as a source of fuel in heating the furnaces. There has just been taken out to the site a ninety horse-power Atlas engine to be used to operate the plant, which means the operating of the retort, crushers and accessories. There are two eighty horse-power boilers now in the railroad yards in DeBeque ready to be transported to the plant site. The crusher and other auxiliary machinery are partly on the ground and partly in the railroad yards.

The fact that the plant site is located upon a knoll gives to the Index Company a great advantage, in that the shale may be blasted from the cliff and collected in a depression between the knoll and the shale proper. I noticed that great blocks of shale, which have fallen in the past, have been collected in this depression, and that none of them have reached the place where the buildings and retorting equipment are located. It is proposed to blast this shale off the

View of shale escarpment from trail along its base

exposed cliff so that it will fall into this depression and can then easily be broken up and transported to the retort by means of a surface railroad. This proposition looks entirely feasible and will undoubtedly decrease the mining expenses by a very large margin.

The construction of the Index Shale Oil Company's plant is under the direct supervision of Chandler Weaver, a prominent and reliable engineer of Philadelphia, Pa. Paul Fidell, Newark, N. J., and Charles S Cook, of Denver, Col., have been in DeBeque for the past three months and have been actively assisting in the construction work of this large commercial unit. P. T. Brown, brother of the inventor, Harry L. Brown, is installing the retort proper. The plant will probably be in operation by early spring.

Progress on other retorts is being made. The first unit of the Ginet Retort on Conn Creek fourteen miles north of DeBeque is practically completed. The condensers have just been installed. which is practically the last accessory to be placed. Some delay

has been caused in freighting the material to De-Beque, otherwise the plant would probably have been in operation ere this. The word is now given out, however, that within the next week the plant will make its initial run. Several hundred barrels have been taken out to the ground.

The Mount Logan Company is also preparing to put on the market its first carload of oil to be educted by the "Simplex process," the first unit of which has been recently perfected.

Work is under way in the construction of the retort on Parachute Creek on the Reed-Doyle holdings.

These, together with progress made in the construction and installation of other retorts, will be described in more detail in a future article.

Advantages of Three-Charge System

(*Continued from page* 338.)

they can. They are under rather rigid control. In a sense, they are in partnership with the public, for in return for the use of the streets and protection from competition, the public requires the very best service at the very lowest rates.

There, however, is something due the company from the public. It must be willing to protect the company from needless loss and the best way seems to be through the approval and use of rates that will protect the interests of the company.

Huge Investments Necessary

The huge investments that have been made in plants and distribution systems have been made to serve the public. It seems only fair that those who benefit most from this service should pay these charges. The office forces and office buildings maintained are also for the convenience of the public. These are charges that must be met and it would also seem only fair that the public, the consumers be asked to pay them if the company is not going to be allowed to make all the profits it can by charging all that the traffic will bear. In other words, the only system fair to both the public and the company would seem to be one where these charges are paid by the customers before any consideration is given to the actual operating expenses. If these charges are met it is possible, as has already been demonstrated, to sell the gas or the electricity at the minimum price. It is possible because the fixed costs are guaranteed and no one is getting something for which he is not paying.

When these costs are not paid by the customer and a depression takes place, as has been the case, when all costs are far above normal, then the fixed charges have to be divided among the consumers who continue to use the service, and they must pay them or the company will have to go out of business. This is manifestly unfair. The rate increases that are now being called for in some cases and which the present conditions of the companies making the demands warrant demonstrate that this is the case.

A flat rate distributes the fixed costs without regard to the actual cost of serving any particular customer. In the days when gas was used for but one purpose this did not matter. There was not enough difference between the customers and the different classes of customers to make it worth while to bother with scientific rates. In addition the companies were small and only a comparatively small capital investment upon which fixed charges must be paid was involved.

Flat Rate Charge

As uses became more diversified, however, and the companies larger the flat rate system has not worked so well. Then in times of great industrial activity the industrial plants paid more than their share of the fixed charges. This wasn't so bad because they could afford to do so. They were making money. When an industrial depression begins, however, and the factories shut down, when the time comes when the householder can least afford to pay the fixed charges, then rates must be raised to such an extent that he will pay them if the company is not to lose money.

The chances are that rates cannot be raised to such an extent. In fact, there must be frequent changes if the rates are never to be too high or too low and the high rates are going to come just when people can least afford to pay them. A situation could be imagined where the rates were increased to meet costs, this increase resulted in a decreased consumption, another increase was found necessary and the process continued until the rates became so high that the company had no revenue at all.

Had the fixed charges been distributed justly and each consumer required to pay these charges in accordance with his demand with no reference whatsoever to his consumption, then the gas company would not suffer because some of its larger customers ceased temporarily to use gas. The fixed charges and the customer charges would be taken care of in any case and the operating costs might be reduced sufficiently to offset the drop in operating revenue.

The three-charge rate system places the business upon a solid business basis. The public and the consumers become real partners in the sense that they always share the risks in that they guarantee that the fixed charges will always be met. The flat rate system places both the company and the customer upon the basis of gamblers who are betting on averages. The past year has demonstrated that in times of depression both the public and the company is bound to lose on such a basis. It can hardly be otherwise.

The facts that are available of the results under modern conditions of operation under these two different classes of rates should be sufficient to convince all rate-making bodies of the wisdom of using the three-charge rate system. In many cases there has been an opportunity of making a comparison of the two systems in the same community. There certainly has never been a more opportune time to put the new system into operation.

Colonel Henry Skinner Dead

Winsted, Conn.—Col. Henry Skinner president of the Winsted Gas Company and veteran of the Civil War, died at his home here April 5 of heart disease. He had been ill for some time, but went to his office just before his death for the first time in six weeks. He was 77 years old.

Colonel Skinner fought at Bull Run. While serving with Company H, Second Connecticut Heavy Artillery, he was taken prisoner but was released by the Confederates in an exchange of prisoners and later became captain of Company H. He was colonel of the old Fourth Regiment, Connecticut National Guard. He leaves a daughter, two brothers and a sister.

Removal of Sulphur Compound

(*Continued from page* 340.)

tion slightly alkaline, without removing a large part of the carbon dioxide of the gas.

That some of the sulphur as hydrogen sulphide is oxidized to sulphate.

Fixed Sulphur Removal Experiments

The other investigation made was to determine the value of hypochlorite solutions as a means of removing carbon disulphide and other fixed sulphur compounds remaining in carbureted water gas after removing hydrogen sulphide. Sodium hypochlorite solutions like those used in the previous experiments were used.

The first determination of fixed sulphur compounds absorption by sodium hypochlorite was made by passing carbureted water gas through a sodium hypochlorite solution having 27.9 grams of available chlorine per liter and 10.02 grams of sodium hydroxide per liter. The results of this experiment are summarized as follows:

Fixed sulphur compounds before absorption, grains per 100 cu. ft.	12.00
Fixed sulphur compounds after absorption, grains per 100 cu. ft.	11.00
Per cent sulphur removed	8.30
Available chlorine before absorption, grams per liter	2.79
Available chlorine after absorption, grams per liter	2.66
Gas through absorbent, cubic feet	2.30
Rate of flow, cubic feet	0.50
Gas analyzed, cubic feet for each determination	2.00

Since not all sulphur remaining in municipal gas after hydrogen sulphide has been removed is present as carbon disulphide, this result cannot be accepted as representing the efficiency of carbon disulphide removal.

Hence the next determination made was on a gas high in carbon disulphide, to determine the value of sodium hypochlorite for removing carbon disulphide. To do this carbon disulphide gas was added to city gas as it comes from the mains. The results of this are summarized as follows:

Carbon disulphide and fixed sulphur compounds in gas berore absorption, grains per 100 cu. ft.	844.00
Carbon disulphide and fixed sulphur compounds in gas after absorption, grains per 100 cu. ft.	9.70
Per cent sulphur compounds removed	9.70
Available chlorine before absorption, grams chlorine per liter	1.50
Available chlorine after absorption, grams chlorine per liter	0.93
Gas through absorbent, cubic feet	1.60
Rate of flow, cubic feet	0.50
Gas for analysis, cubic feet for each determination	1.20

An attempt to improve this efficiency of absorption was made by using a hypochlorite solution of higher available chlorine content, and by using this solution at a temperature of about 100 deg. Cent. the following results were obtained under conditions indicated:

Carbon disulphide + fixed sulphur compounds of gas before absorption, grains per 100 cu. ft.	359 0
Carbon disulphide + fixed sulphur compounds of gas after absorption, grains per 100 cu. ft.	280.0
Per cent sulphur removed	22.0
Available chlorine before absorption, grams per 100 cu. ft.	45.7
Available chlorine after absorption, grams per 100 cu. ft.	37.2
Gas through absorbent, cubic feet	0.980
Rate of flow of gas, cubic feet per hour	0.41
Volume of gas analyzed after absorption, cubic feet	0.960
Volume of gas analyzed before absorption, cubic feet	0.980

In a further attempt to improve this efficiency some catalytic materials were added under substantially the same conditions as above. The amount in each case as about 15 grams per liter of solution. The effect on the efficiency of sulphur removal of each of the substances is:

	Per Cent
Sodium hypochlorite of 3 grams available chlorine and 10 grams sodium hydroxide per liter in the cold withous catalyst	17.00
The same at 100 deg. Cent.	9.64
Cold + nickel oxide (Ni_2O_3)	18.00
Cold + zinc oxide (ZNO)	16.70
Cold + iron oxide (Fe_2O_3)	17.90

The results thus obtained show a fairly constant per cent of sulphur removal without appreciable increase due to the presence of catalytic materials. Hot hypochlorite solution, however, gave much poorer efficiencies than those obtained in the cold, a fact confirmed by subsequent determinations. Evidently, then, the increased efficiency obtained when a hot and concentrated solution was used was due to the higher available chlorine content of the solution, and not to the increase in temperature of absorption.

To determine what effect a more intimate contact of gas and absorbent would have on the efficiency of removal, a volume of gas was passed repeatedly through a cold hypochlorite solution. The result is summarized as follows:

Carbon disulphide and fixed sulphur compounds in the gas before absorption, grains per 100 cu. ft.	536.0
Carbon disulphide and fixed sulphur compounds in the gas after absorption, grains per 100 cu. ft.	347.0
Per cent sulphur removed	35.25
Gas passed through solution, number of times	7.0
Rate of passage of gas, cubic feet per hour	1.0
Available chlorine before absorption, grams per liter.	3.61
Available chlorine after absorption, grams per liter.	1.3
Volume of gas for sulphur analysis before absorption, cubic feet	0.710
Volume of gas for sulphur analysis after absorption, cubic feet	0.587

From the results of this determination it follows that the amount of sulphur compounds (principally carbon disulphide) absorbed is directly dependent on the intimacy of contact between the gas and the absorbent.

To obtain a more intimate contact of gas and absorbent than was possible with the apparatus used up to this time, the gas was washed by passing it through a series of three absorption towers. The towers were packed with pebbles and arranged in cascade, the liquor flowing over the pebbles counter-current to the flow of gas. The gas by this arrangement passed up a column of packing 27 in. high and 2 in. in diameter. The conditions existing and the results obtained using a concentrated and a weak absorbent are summarized as follows:

	Weak	Concentrated
Carbon disulphide + fixed sulphur in gas before absorption, gr./100 c. f.	78.2	78.2
Carbon disulphide + fixed sulphur in gas after absorption, gr./100 c. f.	60.3	56.0
Per cent sulphur removed	23.0	28.5

	Weak	Concentrated
Volume of gas passed through, cu. ft.	1.564	1.534
Rate of passage of gas, cu. ft. per hr..	0.67	0.6
Available chlorine per liter before absorption, grams	0.0470	3.082
Available chlorine per liter after absorption, grams	0.0407	2.860
Grams chlorine removed	0.319	0.557
Volume of absorbent used, c.c.	3700.0	2500.0
Rate of flow of absorbent, liters/hr..	7.5	8.2
Temperature of absorption, deg. Fahr.	72.0	72.0
Volume of gas for sulphur analysis, cubic feet	0.80	0.80
Grams NaOH per liter	0.318	0.685

A determination to check these results, using a hypochlorite having 2.863 grams of available chlorine per liter and 0.320 gram of sodium hydroxide per liter under substantially the same conditions as the two above determinations, but using a rate of passage of gas of 0.5 cu. ft. per hour, gave an efficiency of removal of 30.44 per cent of the sulphur compounds. The results of this and previous determinations show:

That the removal of carbon disulphide and fixed sulphur compounds by sodium hypochlorite solution varies directly as the efficiency of the scrubbing device.

That under these conditions a reasonable variation in the amount of hypochlorite in the solution has but little effect on the amount of sulphur removed.

Using the tower gas-washing apparatus, a second determination was made on Madison City gas to determine the amount of fixed sulphur compounds removable. The following is a summary of the conditions and the results:

Fixed sulphur compounds in gas before scrubbing, grains per 100 cu. ft.	10.01
Fixed sulphur compounds in gas after scrubbing, grains per 100 cut. ft.	5.4
Per cent sulphur removed	46.0
Volume of gas passed through, cubic feet	4.2
Rate of passage of gas, cubic feet per hour	0.864
Available chlorine before absorption, grams per liter	0.86
Available chlorine after absorption, grams per liter.	0.575
Volume of absorbent, liters	4.0
Rate of flow of absorbent, liters per hour	6.0
Amount of chlorine consumed, grams	1.14
Grams sodium hydroxide per liter	0.234
Volume of gas used for sulphur analysis before absorption, cubic feet	3.796
Volume of gas used for sulphur analysis after absorption, cubic feet	3.413

Los Angeles to Have 10,000,000-Ft. Holder

Los Angeles, Cal.—Projected as the largest structure of its kind in the entire West, a gas holder which will hold 10,000,000 cu. ft. of gas, will cover the larger part of a city lot and cost approximately $1,000,000 completed, is now being planned by the Los Angeles Gas & Electric Corporation.

The mammoth holder is to be located on the block bounded by Jackson, Ducommun, Center and Vignes Streets and the foundation is to be completed, it is expected, by September, in order that construction of the enormous steel container may be begun by Bartlett Hayward Company at that time.

The holder will be constructed of finest ingot iron, approximately 270 ft. in diameter, lacking 30 ft. of the extreme dimension of a city block. In order to contain its 10,000,000 cu. ft. capacity, it will then rise 195.1 ft. into the air, or near twenty stories.

When full, the holder will contain more than enough gas to fill twenty-seven balloons such as the Goodyear blimp, which requires 37,000 cu. ft., or one-half the amount required by consumers of the city of Los Angeles on a warm spring day.

The city's largest holder at present is one with a capacity of 6,000,000 cu. ft., three-fifths as large as the proposed holder for which land has been purchased and contracts are being drawn up. The total capacity of the company's various holders is approximately 25,000,000 cu. ft.

The necessity for the huge gas holder, which will be the largest this side of the big manufacturing cities of the East, has been brought about by the enormous growth of Los Angeles, and the consequent increase in gas consumption. On the record day this winter more than 52,000,000 cu. ft. of gas was sent out by the company.

Reduces Price of Gas

Watertown, N. Y.—A reduction in the price of gas from $2.17 to $2 per thousand cubic feet, effective May 1, was announced April 6 by the Northern New York Utilities, Inc., as a decision reached by the board of directors. A flat rate of $1.85 per thousand cubic feet to consumer using 100,000 cu. ft. a month is also announced.

The concession comes as a complete surprise to the citizens of this community and as an entirely voluntary move on the part of the new owners of the company. It is recognized as entirely in harmony with the announced policy of the new owners to give the customers the benefit of cheaper cost of production as soon as prices warranted.

Seven new directors were elected at the meeting, bringing into the organization several important concerns. There are still five more members provided under a recent authorization, and when these are appointed twenty-five members will comprise the board.

The new directors named are: Stuart D. Lansing, president of the Bagley & Sewall Company; G. Seymour Knowlton, treasurer of Knowlton Brothers, Inc.; Carl H. Hanna, vice-president of the Hanna Paper Corporation; Frank A. Empsall, treasurer of the St. Regis Paper Company; James A. Outterson of Carthage, president of the Carthage Sulphite, Pulp & Paper Company; William K. Dick of New York, director of the St. Regis Paper Company; T. F. Crane of New York, one of the owners of the Benson Mines Company at Benson Mines.

The directorate to which the above men were added was composed of F. L. Carlisle, president of the St. Regis Paper Company, chairman; C. C. Burns, general manager of the St. Regis Paper Company; D. M. Anderson, vice-president of the St. Regis Paper Company; John N. Carlisle, president of the Northern New York Utilities, Inc.; H. G. Davis, general manager of the company; Mark A. Hanna, president of the Hanna Paper Corporation; Harry S. Lewis, head of the H. P. Lewis Corporation; D. C. Middleton, vice-president of the St. Regis Paper Company; B. B. Taggart, president of Taggart Brothers Company; John J. Warren, president and treasurer of the Warren Parchment Company and vice-president of the St. Regis Paper Company; Mark S. Wilder, president of the Diana Paper Company; Thomas J. Walsh of E. H. Rollins & Sons of New York City.

Public Utilities Securities Market Report

Prices of Representative Gas Bonds

(Quotations furnished by The National City Company)

Company	Issue	Maturity	—Market— Apr. 14, 1921 Bid	Asked
American Lt. & Trac. Co.	Five Year 6s	May 1, 1925	88	89
Brooklyn Union Gas Co.	First Consol. 5s	May 1, 1945	76	78
Columbia Gas & Elec. Co.	First 5s	Jan. 1, 1927	83½	85
Consol. Gas, Elec. Lt. & Pr. Co. of Baltimore	First Ref. 7½s	Dec. 1, 1945	99¼	100¼
Consol. Gas, Elec. Lt. & Pr. Co.	General 4½s	Feb. 14, 1935	75	76
Consol. Gas Co. of New York	Sec. Conv. 7s	Feb. 1, 1925	100½	101
Consol. Gas Co. of New York	One Year Sec. 8s	Dec. 1, 1921	99⅞	100⅛
New Amsterdam Gas Co.	First Consol. 5s	Jan. 1, 1948	59	62
Denver Gas & Elec. Co.	Gen. (now 1st) 5s	May 1, 1949	80½	82
Detroit City Gas Co.	Gold 5s	Jan. 1, 1923	91	93
Equitable Illum. Gas Lt. Co. of Philadelphia	First 5s	Jan. 1, 1928	92½	96
Hudson County Gas Co.	First 5s	Nov. 1, 1940	74	77
Laclede Gas Light Co.	Ref. & Ext. 5s	Apr. 1, 1934	72	75
Louisville Gas & Elec. Co.	First & Ref. 7s	June 1, 1923	94	95½
Michigan Light Co.	First & Ref. 5s	Mar. 1, 1946	70	75
Milwaukee Gas Light Co.	First 4s	May 1, 1927	80	82
Pacific Gas & Elec. Co.	Gen. & Ref. 5s	Jan. 1, 1942	77½	77¾
Pacific Gas & Elec. Co.	Col. Tr. Conv. 7s	May 1, 1925	96	97
Pacific Gas & Elec. Co.	First & Ref. 7s	Dec. 1, 1940	98	99
Cal. Gas & Elec. Corp.	Unif. & Ref. 5s	Nov. 1, 1937	85	86
Peoples' Gas Lt. & Coke Co.	Refunding 5s	Sept. 1, 1947	70¼	71
Chicago Gas Lt. & Coke Co.	First 5s	July 1, 1937	72½	75
Portland Gas & Coke Co.	First & Ref. 5s	Jan. 1, 1940	75	77
Seattle Lighting Co.	Refunding 5s	Oct. 1, 1949	65	67
Southern California Gas Co.	First 6s	Nov. 1, 1950	85½	87½
United Gas Improvement Co.	Two Year 8s	Feb. 1, 1923	99	99½
Utica Gas & Electric Co.	Ref. & Ext. 5s	July 1, 1957	75	78
Washington Gas Light Co.	General 5s	Nov. 1, 1960	77	78
Western States Gas & Elec. Co. of California	First & Ref. 5s	June 1, 1941	74	76½

Standard Gas Earnings

Earnings reports of Standard Gas & Electric Company utility subsidiaries for the year ended Feb. 28, 1921, show satisfactory increases in both gross and net. The month of February in general was marked by substantial increases in business connected and by an improvement in the increase of electric energy output. Signs of an early resumption of industrial activity in many of the territories served give hope of a speedy return to a normal rate of increase in the use of electrical energy for power purposes. The gas properties continue to report exceptional increases in the use of manufactured gas, due to the more extended use of gas for heating purposes.

To Install U. G. I. Automatic Controls

The U. G. I. Contracting Company of Philadelphia has recently received orders to install U. G. I. automatic controls at the following places: Indianapolis, Ind. (2); New Haven, Conn. (2), and Hammond, Ind.

Present Rate Inadequate

Detroit, Mich.—The city council has been asked by the Detroit City Gas Company to sanction an increase in the domestic gas rates. The increase authorized a short time ago from 79 to 85 cents per 1,000 ft. is insufficient for even operating expenses, according to the statement filed by the company.

Companies Place Orders

The Gas Machinery Company, of Cleveland, Ohio, has received orders for installing bench fillings with stop end retorts at Waukesha, Wis., and Lincoln, Ill., orders for benches of through sixes at Canandaigua, N. Y., and Bellefontaine, Ohio, orders for benches of through eights at Cambridge, Mass., and orders for benches of inclined retorts at Lynn, Mass., San Juan, Porto Rico, Mobile, Ala., and Charlotte, N. C.

All of these orders include sectional silica retorts and settings of the most modern design.

Several Cases for April Term Supreme Court of Fulton County, N. Y.

Frank Kathan vs. East Creek Electric Light & Power Company. Action, trespass.

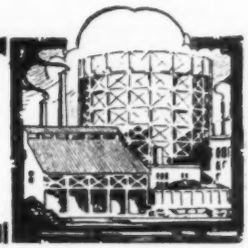
Fulton County Gas & Electric Company vs. Rockwood Manufacturing Company, vs. Rockwood Manufacturing Company, Inc. Action for damages and injunction.

City of Gloversville vs. Fulton County Gas & Electric Company. Action for penalty

Remodeling Gas Apparatus

In line with the general improvements of its plant, the Richmond (Va.) City Gas Works is having its 10 ft. 6 in. carbureted water gas apparatus remodeled, including the addition of air and steam controls and U. G. I. automatic control. The U. G. I. Contracting Company, of Philadelphia, is doing the work.

NEWS OF THE GAS INDUSTRY



Pennsylvania and New Jersey Associations in Joint Convention

Decide to Organize Conference with Neighboring States

A joint meeting of the Pennsylvania Gas Association and the New Jersey Gas Association was held April 13, 14 and 15 at the Adelphia Hotel, Philadelphia, Pa. Each association held a business meeting in the forenoon of the rst day at which officers for the ensuing year were elected.

The new officers of the New Jersey Gas Association are as follows:

President, H. H. Newman, Trenton, N. J.; vice-president, C. W. Wardell, Gloucester, N. J.; secretary-treasurer, H. E. Mason, Long Branch, N. J.; directors: D. A. Worrell, Philadelphia; M. C. Fox, Philadelphia, and W. P. Adams, Millville, N. J.

The new officers for the Pennsylvania Gas Association are:

President, E. L. Smith, Towanda, Pa.; first vice-president, Luther Gaston, Lebanon, Pa.; second vice-president R. B. Hull, Lancaster, Pa.; secretary-treasurer, G. S. Cullen, Harrisburg, Pa. New members of the council: G. B. Bains, 3rd; W. Griffin Gribbel, W. R. Rhoades and T. W. McDonald.

In his remarks on B.t.u. and rates J. H. Kippelman, retiring president of Pennsylvania Gas Association, stated that it was the first time in his recollection that the State Commission of Pennsylvania had recognized the Pennsylvania Gas Association. At the meeting with the State Commission on the B.t.u. standard question, the evidence presented was so convincing that the commissioners acted quickly and granted what the committee asked for, and the law of the State now fixes the standard at 520 B.t.u.

W. Griffin Gribbel, chairman of the membership committee, presented the following report:

"The membership committee have given careful thought to the matter of membership in gas associations in general, and have been impressed with the fact that membership committees, as a rule, do not largely increase the membership in trade associations by their personal effort. This is due to a number of rather obvious reasons.

"It is hardly possible to expect the personnel of any membership committee to personally go into the field and solicit members to any great extent. It would seem that the best and most productive course to pursue would then be to lessen the obstacles in the way of voluntary membership. With this thought in mind your committee beg to submit the following suggestions:

"That the expense of the association be borne in the main by those directly interested in the well being of the industry, and who are responsible for the existence of the association, namely the gas companies.

"That officers and employees of the gas companies, underwriting the expenses of the association, should be eligible for membership on the payment of a small registration fee. Also that individuals selling supplies to these gas companies bear a fixed share in the support of the association.

"Further, to increase the incentive to membership it is recommended that there be held in addition to the annual meeting of the association in April two other meetings of one day duration in September and December respectively, at such time and place as the as the council may designate.

"It is further recommended by your committee that well considered steps be taken looking to a union, without loss of identity, of the two strongest gas associations in this territory, namely, the New Jersey State Gas Association and the Pennsylvania Gas Association, under an appropriate title, to be decided upon later.

"In connection with this the committee beg to call to your attention the significant fact that in April, 1920, the annual meetings of the two above mentioned associations were coincidently held in Philadelphia, and that at the last meeting of the New Jersey State Gas Association it was decided to hold their annual meeting in April at the same time and place as the Pennsylvania Gas Association. A union of these two associations would seem to promise a gathering of considerable importance, drawing membership from New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, and possibly from parts of New York and West Virginia. Such a conference would be in a position to substantially assist in any national movements the American Gas Association should be required to inaugurate.

"The changes proposed in the beginning of this report have received the approval of the executive council."

After considerable discussion the report was adopted. Then the following resolution was introduced, and was adopted by both associations:

"Whereas, The continued development of the gas industry is hindered by lack of accurate public information of the conditions under which it is operating; be it

"Resolved, That steps be taken to give widest circulation to all

possible economies in methods of manufacture and distribution, and that every encouragement be offered to the free discussion of ways and means by which to clearly set forth the actual condition confronting the industry; be it further

"Resolved, That the association join with the New Jersey Gas Association in a permanent conference to be known as the Eastern States Gas Conference and that the president be requested, jointly with the president of the New Jersey State Gas Association, to form a committee representing the gas interests in the States of Pennsylvania, New Jersey, Maryland, Delaware and West Virginia and of the District of Columbia to draw up regulations for the government of the conference. Such regulations to be ratified by the council of the associations who are herewith empowered to do all things necessary to the creation of this conference in the name of this association."

Somewhat of an innovation was created in that there were few prepared papers. A large part of the proceedings being in the form of talks and discussions.

Dr. Hollis Godfrey, president of Drexel Institute, Philadelphia, on the "Training and Retaining of Men," gave an outline of the work of the institute for the past eight years in investigating different industries. As the speaker expressed it, "Taking things apart, removing the waste, and putting the organization together again." He made a plea for the specially trained college man in business.

W. Percy Hall, assistant secretary-manager, American Gas Association, outlined some of the activities of the American Gas Association in assisting the State associations by taking up the larger problems of the gas industry which could be handled to better advantage by the National Association.

F. D. Daniels, of the Pennsylvania State Health Department, read a paper on "Stream Pollution."

W. A. Ehlers, industrial fuel engineer of the American Gas Association delivered a talk on the "Value to the Gas Company of Its Industrial Fuel Business, and Ways and Means for Securing and Retaining This Class of Business." This paper will be published in a later issue of the American Gas Journal.

The banquet was held Wednesday night and was well attended.

On Thursday the Hon. George Wilder Cartwright, of California, made an address, and M. L. Carraway, Norfolk, Va., read a paper on "What Sort of Publicity Does the Gas Industry Need Most at This Time?" The afternoon was taken up by an outing.

Gas Company Changes Hands

Owosso, Mich.—Purchase of the stock of the Owosso Gas Company by Seth Q. Pulver and C. D. Bell of this city, and Walter M. Bush of Corunna, was announced recently. The stock was purchased of the Dean family, of Ann Arbor, founders of the company.

The deal has been pending for some time and was consummated when Messrs. Bell and Bush went to Detroit for that purpose.

The new owners of the company state that there will be no change for the present in the personnel of the company's force, and say they have no announcement to make regarding their plans for the future, other than that it will be their aim to give satisfactory service to the company's patrons.

"We naturally wish to wait until we become thoroughly familiar with the details of the business before we make any particular announcement," declared Mr. Pulver. "We wish, however, to assure the gas consumers of Owosso that it will be our aim to give satisfactory service."

The gas company was formed nearly forty years ago by the Dean family, which has owned it since.

Municipal Plant to Improve Works

The Municipal Light Board of Wakefield, Mass., has awarded the contract to the U. G. I. Contracting Company, of Philadelphia, for improvements to the gas plant at that place. The work includes the installation of new carbureted water gas apparatus, motor driven and turbine driven blowers, tar extractor and condenser, with the necessary connections for each. Eighteen hours after this contract was received the U. G. I. Contracting Company had the first car load shipment moving to its destination.

Asks Co-operation of Consumers

Harrisburg, Pa.—"Our business is not merely to sell gas but to give you good gas service, as well," said George L. Cullen, commercial agent of the Harrisburg Gas Company. "Therefore," he continued, "Do us the favor of selecting our office as the proper place to register complaints.

"We invite your help and co-operation at all times. We are always ready to make investigation, and any errors will be promptly rectified.

"It is our constant endeavor to give you a service which is complete and satisfactory in every detail. Any employee who fails to recognize this fact and who does not do his utmost to serve you is not rightly representing our company and its policy toward the public. Our policy: The public is entitled to courteous treatment and to the best possible service."

Offers Cost Plus Rate

Temple, Texas.—The Temple Gas Light Company has submitted for informal consideration by the city council a proposed new franchise to extend over a period of fifty years in which rates are to be fixed at cost plus 10 per cent returns on actual capital invested, annual audit to establish the basic figures.

Provision is also made to substitute natural gas for the manufactured product at any time. Under provisions of the franchise the city is also granted the privilege of purchasing the plant by paying a price ascertained to represent the actual investment, less funded indebtedness retired amount in sinking and depletion funds. The council is giving the matter consideration but no decision is expected for some time.

Arkansas Natural Gas

Pittsburgh, Pa.—After payment of accrued dividends, retiring preferred stock and a block of bonds, the Arkansas Natural Gas Company closed the 1920 year with cash surplus of $994,318, which compares with $99,886 in 1919, in which no dividends whatever were paid. This showing is due largely to company's extensive oil operations in Homer, La., field.